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(56) Documents Cited
GB 1538048 A EP 0085534 A1 WO 90/10580 A1
DE 002641484 A US 4515840 A US 3948436 A

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(54) Heat reflective and impact resistant protective bag

(57) A protective bag, such as the envelope shown in Figure 1, is produced from a cushioning material comprising an inner layer (6) of resilient plastics material, such as polyethylene foam, and an outer layer (8) providing an external reflective surface, which may be afforded by aluminium. The outer layer may be a plastic or paper carrier layer onto which the aluminium is applied either by a spraying process or a laminating process. The inner cushioning material by its nature possesses good heat insulation properties and when combined with the heat reflective and heat radiative properties of the outer layer ensures that the envelope can not only be used to protect a article against damage, but also prevent deterioration of the article by undue temperature variations.

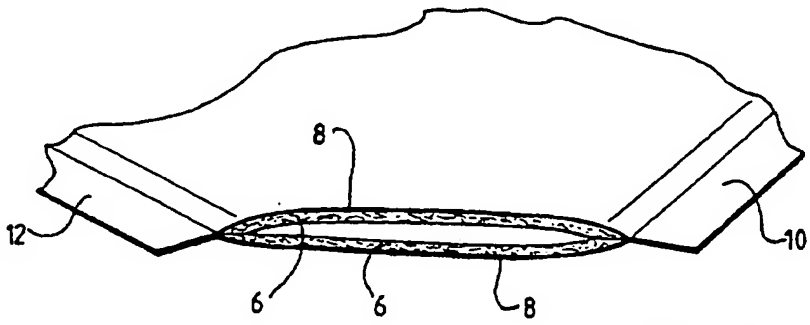

FIG 2

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The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1995

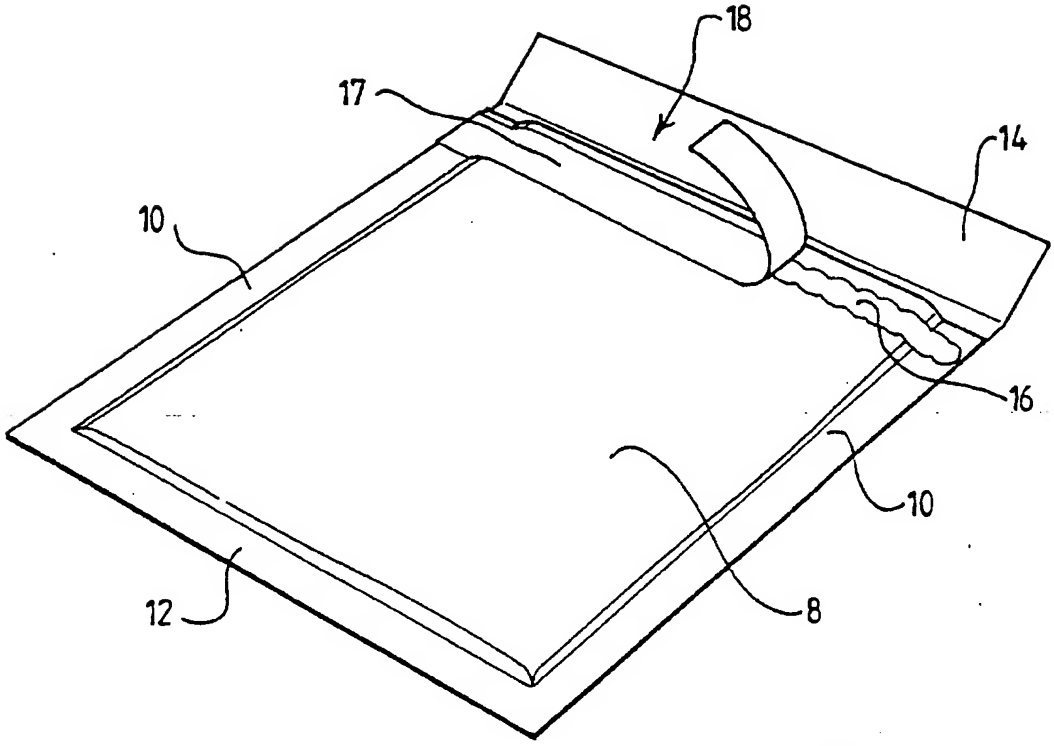

FIG 1

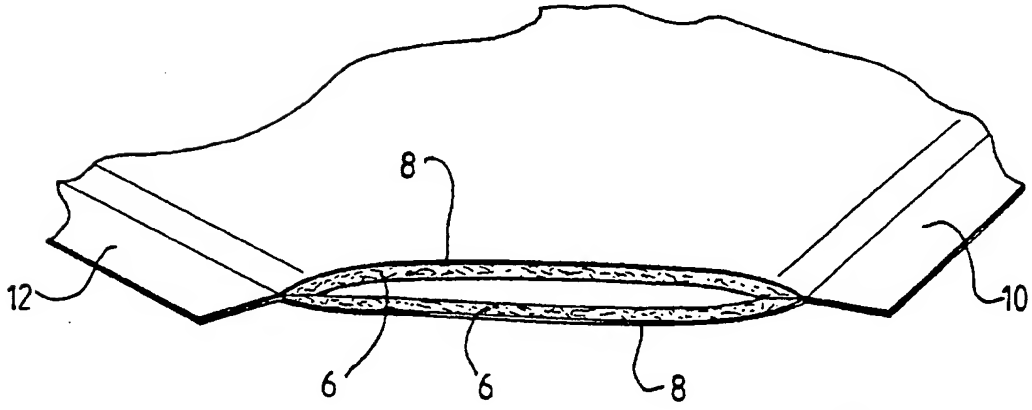

FIG 2

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PATENTS ACT 1977

WL/MJ/A8949GB

Title: IMPROVEMENTS RELATING TO PROTECTIVE BAGS

Description of Invention

This invention is concerned with improvements relating to protective bags, and in particular with the provision of an improved cushioning material for use in the manufacture of protective bags.

The term "bag" is used herein to include bags of a variety of size, including smaller bags of the kind which may be referred to as "envelopes".

A conventional protective bag comprises an outer layer and an inner, cushioning layer which may be secured to the outer layer by adhesive, such a protective bag being referred to as being of the kind specified.

The outer layer may be of a brown paper-like material such as Kraft, and the inner layer may be of a resilient foam plastics material such as polyethylene, polypropylene, polyurethane or the like. Alternatively the inner layer may be of "bubble" material - that is, material afforded by two thin sheets of plastic material having discrete pockets formed between them and in which pockets air is trapped.

Two sheets or portions of such material may in use be secured together along side and bottom edges by the use of heated rollers, with the cushioning layer collapsing and affording an adhesive material, leaving one end of the bag open. Conventionally a flap is provided which may be used to close the open end.

According to this invention there is provided a protective bag of the kind specified wherein the outer layer has an outer face which is reflective.

In this manner a protective bag may be provided having excellent heat insulating properties, the heat insulation properties of the materials conventionally utilised as cushioning means being complemented by the heat reflective and radiative qualities of the outer layer.

The outer layer may be provided by or comprise plastics sheet having a coating deposited thereon such as by a spraying or laminating process, such as aluminium. Conveniently utilised is a coated Melinex available from ICI, but other polyester files may be used.

Alternatively the outer layer may be afforded by aluminium foil, conveniently having a thickness in the range 5 to 25 microns, laminated to paper, such as Kraft, having a weight of 50-150 grammes, or plastic film such as LDPE having a thickness of 100 microns or less.

According to this invention there is also provided a cushioning material for use in the manufacture of a bag of the kind set out above.

There will now be given a detailed description, to be read with reference to the accompanying drawings, of a protective bag which is a preferred embodiment of this invention, having been selected for the purposes of illustrating the invention by way of example.

In the accompanying drawings:

FIGURE 1 is a perspective view of a preferred embodiment;

FIGURE 2 is a view showing a corner region of the bag, part having been broken away for the purpose of clarity.

The bag which is the preferred embodiment of this invention is produced from a cushioning material which is also illustrative of the invention in certain of its aspects, comprising an inner layer 6 of a resilient plastics material, conveniently polyethylene foam, and an outer layer 8 afforded by aluminium.

Advantageously the aluminium is provided on a carrier, which may be provided by a layer of paper, or a layer of plastic sheet. The aluminium on the carrier layer may be provided by a lamination operation, but is preferably provided by a "metalising" or spraying process, by which a layer of aluminium having a thickness in the order of 10 microns is provided on the carrier.

Most conveniently the outer layer is afforded by an adhesive laminate consisting of a sheet of polyester film having a thickness of approximately 12

microns, which has been barrier metalised, such as Melinex 800, together with a carrier layer of 32 micron L1 type low density polyethylene.

However it is to be appreciated that other materials may be utilised in the outer layer 8.

In the manufacture of the bag two sheets of the material are brought together with the inner layers adjacent, and material produced on a continuous basis from rolls thereof are sealed together at parallel longitudinal edge portions producing a selvedge 10. Securement is carried out by the use of heated rollers, causing the plastics material constituting the foam layer to melt, to act as an adhesive.

The two layers are also secured together, again conveniently by the use of heat and pressure, at spaced intervals extending transversely between the two side edge portions 10, as shown at 12, to provide a sealed bottom edge of the protective bag.

In a conventional manner the bag is provided with a flap 14 which may be folded over and secured to the body of the bag and retained in position by adhesive 16, conveniently exposed by the use of a peel-off strip 17. Conveniently the adhesive layer 16 extends across the whole width of the bag.

Thus an article may be inserted into the bag through the opening 18 and the flap 14 folded down and secured in position by the use of the adhesive layer.

The combination of the inner layers 6 and the outer layers 8 effectively provide the protective bag with excellent insulation qualities, enabling the bag not only to protect the article against damage by breakage, but also to prevent damage to the article by undue temperature variations.

It will be appreciated that whilst in the preferred embodiment an inner layer comprising plastics foam is utilised, other cushioning materials may be utilised, such as bubble material, or a combination of bubble material and foam sheet, notwithstanding conveniently a thermoplastic material is utilised which may on the application of heat and pressure be reduced to afford the adhesive layer

securing the inner and outer layers together, and the inner layers of the two sheets of cushioning material together.

Additionally it will be appreciated that whilst in the preferred embodiment aluminium foil is utilised, other materials may be utilised, the criterion being that the outer layer has an outer surface which is reflective, reducing absorbtion of external radiation, and thus reducing the tendency of the bag to be heated by the external environment.

Additionally however the use of aluminium foil provides high quality protection to an article being protected by the bag against penetration of liquid or paper contaminants, and particularly where the flap may be closed to fully seal the opening, highly efficacious protection may be afforded.

If desired, the resilient layers 6 may be sandwiched between two layers having outer surfaces which are both reflective, providing an inner surface of the bag which is reflective.

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

CLAIMS

1 A protective bag of the kind specified wherein the outer layer has an outer face which is reflective.

2 A protective bag according to Claim 1 wherein the outer layer is provided by or comprises plastics material having a coating deposited thereon by a spraying or laminating process.

3 A protective bag according to any one of the preceding claims wherein the coating is aluminium.

4 A protective bag according to any of one of Claims 1, 2 and 3 wherein the outer layer is afforded by aluminium foil.

5 A protective bag according to Claim 4 wherein the aluminium foil has a thickness in the range of 5 to 25 microns.

6 A protective bag according to one of Claims 4 and 5 wherein the aluminium foil is laminated to a substrate.

7 A protective bag according to Claim 6 wherein the substrate is paper having a weight within the range of 50 to 150gms per m^2.

8 A protective bag according to Claim 6 wherein the substrate is a plastic film having a thickness of 100 microns or less.

9 A cushioning material for use in the manufacture of a protective bag, the cushioning material comprising an outer layer of paper-like material and an inner, cushioning layer, characterised in that the outer surface of the outer layer is

reflective.

10 A protective bag constructed and arranged substantially as herein described with reference to the accompanying drawings.

11 Any novel feature or novel combination of features herein before described and/or shown in the accompanying drawings.

The Patent Office

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Application No: GB 9618234.0 **Examiner:** Lawrence Cullen
Claims searched: 1-10 **Date of search:** 29 October 1997

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): B8K (KWC, KWX)

Int Cl (Ed.6): B65D 30/02, 30/08; 81/00, 81/02, 81/03, 81/05, 81/18, 81/30, 81/38

Other: ONLINE: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 1,538,048	(LATTER) see lines 25-53 and lines 75-79, page 1	1-4, 6 and 9
X	EP 0 085 534 A1	(BRITISH PETROLEUM) line 34, page 2 to line 1 , page 3 and claim 6	1-4 and 6
Y	WO 90/10580 A1	(CHRISTIANSEN) See line 30, page 4 to line 9, page 5 and Figure 1.	1-6
X	DE 2,641,484 A1	(CETA) See Figures 1 and 2 and paragraphs 1-4 page 3 and paragraph 1, page 4.	1-6 and 9
X	US 4,515,840	(GATWARD) See lines 55-60, column 1; lines 31-38, column 3, and Figures 2 and 3.	1-6, 8, 9 and 11
Y	US 3,948,436	(BAMBARA) See lines 43-53, column 2 and Figure 1.	1-6

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.